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2021-01

Tang , X , Upadyaya , K & Salmela-Aro , K 2021 , ' School Burnout and Psychosocial Problems among Adolescents : Grit as a Resilience Factor ' , Journal of Adolescence , vol. 86 , pp. 77-89 . https://doi.org/10.1016/j.adolescence.2020.12.002

http://hdl.handle.net/10138/327513
https://doi.org/10.1016/j.adolescence.2020.12.002

acceptedVersion

School Burnout and Psychosocial Problems among Adolescents: Grit as a Resilience Factor

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(The paper is accepted by the *Journal of Adolescence*. The final version of the paper may appear differently from this one)

To cite:

Tang, X., Upadyaya, K., & Salmela-Aro, K. (2021). School burnout and psychosocial problems among adolescents: Grit as a resilience factor. *Journal of Adolescence, 86*, 77–89. https://doi.org/10.1016/j.adolescence.2020.12.002

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Acknowledgement

The study has been supported by the Academy of Finland Grants 263328 Mind-the-Gap, 308351 Bridging the Gaps, which are awarded to Katariina Salmela-Aro. The authors have been supported by Business Finland, AI in learning project.

The authors thank Sanna Tuovinen for her comments and intellectual contributions to the earlier draft of the manuscript, and thank Anne Lakkavaara for her comments to the earlier draft of the manuscript.

Abstract

Introduction:

The present study investigated whether grit can mitigate the associations between school burnout, loneliness, and depressive symptoms among adolescents. It also examined gender differences.

Methods:

This study included 1296 seventh and 1166 eighth graders from Finland. The study variables were self-reported and regression analysis was performed.

Results:

This study found that two grit facets – consistency of interest and perseverance of effort – played resilient roles in school burnout. A high level of grit substantially reduced reported depressive symptoms when adolescents experienced high school burnout. Our further analysis showed that the role of grit was more pronounced among boys than among girls. When male adolescents were at risk of school burnout, both consistency of interest and perseverance of effort protected them and they had only low levels of loneliness and depressive symptoms.

Conclusions:

This study demonstrates that grit can act as a resilience factor among adolescents.

Keywords: Resilience; Grit; Burnout; Loneliness; Depressive Symptoms; Gender

School Burnout and Psychosocial Problems among Adolescents: Grit as a Resilience Factor

School burnout, known as the phenomenon of being exhausted, amotivated, and disengaged from schoolwork (Salmela-Aro, Kiuru, et al., 2009), is associated with numerous school maladjustment and mental health problems (Bask & Salmela-Aro, 2013; Fiorilli et al., 2017; Madigan & Curran, 2020; Salmela-Aro, Savolainen, et al., 2009). Consequently, how to prevent school burnout or help burned-out students recover is an important topic for researchers, psychologists and educators (Romano et al., 2020; Salmela-Aro & Upadyaya, 2014). Resilience, the capacity to successfully adapt in the face of adversity (Masten & Cicchetti, 2016), is an important factor that may prevent burnout among adolescents (Fiorilli et al., 2020; Skinner & Kindermann, 2020). As resilience typically contains multiple components (Masten & Cicchetti, 2016), this study aims to examine whether grit acts as a resilience factor that may help burned-out adolescents have less mental health problems. Defined as the passion and perseverance for long-term goals (Duckworth et al., 2007), grit has been found to associate with low levels of depressive symptoms and negative affect (Datu et al., 2019; Jiang et al., 2019), high levels of life satisfaction and positive affect (Jiang et al., 2019). However, the mitigation effect of grit among people in disadvantaged situations has been studied rarely, particularly among adolescents. Thus, we aim to assess the role of grit as a moderator of the association between burnout and poor mental health (loneliness and depressive symptoms in this study).

Resilience, Risk and Adaptation

The study of resilience dates back over 50 years when a puzzling but encouraging phenomenon emerged: some children who grow up in an adverse environments adapt well later on (Luthar et al., 2000; Masten & Cicchetti, 2016). Understanding the mechanism behind this phenomenon is intuitively important as it may help thousands of children at risk to recover from adverse events/environments and eventually function well. There are different assumptions

regarding the role of resilience in why some children who grow up in adverse environments adapt well later in life (Kaplan, 1999; Luthar et al., 2000; Masten & Cicchetti, 2016). The first view assumes that children who adapt later possess some personal attributes/qualities that help them overcome the adversities they have encountered. According to this view, resilience is a fixed and stable trait that enables some children to manage risk situations and to later develop positively (Block & Kremen, 1996; Skodol, 2010). In contrast, the second view regards resilience as a dynamic process that depicts adaptive changes under conditions that threaten an individual's survival or psychological growth. According to this view, resilience emerges from the interaction between an individual's resources and the risky events they encounter. Accordingly, resilience could be regarded as a framework term that includes components at multiple levels (e.g., personal, family, school; Liu, Reed, & Girard, 2017; Masten & Cicchetti, 2016). To us, the second view of resilience is more inclusive, and the first view can be integrated into it. If a personality trait can help an individual overcome adversities, then it is reasonable to include this trait as part of resilience. In other words, resilience itself is not a trait; it can comprise multiple adaptive capacities (e.g., self-control, hope; Goodman, Disabato, Kashdan, & Machell, 2017; Masten & Cicchetti, 2016). The critical point here is whether resilience should be regarded as a single distinct entity or as a latent entity into which multiple entities can be integrated. Treating resilience as a single distinct entity, which forms the roots of the first view of resilience, may naturally guarantee it a unique and exclusive conceptual position, but it may also lead to the misbelief that resilience is a capacity one either has or does not have. More importantly, recent findings regarding the diverse trajectories of resilience effects have challenged the idea that resilience is a fixed stable trait (Infurna & Luthar, 2016, 2017). When studying the resilience process after spousal loss (a single adverse event), Infurna and Luthar (2017) found that the resilience trajectories varied intensively according to five well-being indicators: life satisfaction, negative affect, positive affect, general health and physical functioning. Participants were found to show resilience in one domain but not in another, and only

8% of them displayed resilience in all five domains. Thus, if resilience is a stable trait that some people have and others do not, why are those people resilient in some domains but not in others?

The present study concurs with the second view of resilience, which Masten and Cicchetti (2016, p.5) have defined as '*the potential or manifested capacity of an individual to adapt successfully through multiple processes to challenges that threaten the function, survival, or positive development*'. Within the individual-level processes, they list, for example, self-efficacy, mastery, motivation, and self-regulation. According to this view, two criteria generally define resilience: *adverse conditions* and *adaptation to adversity* (Luthar et al., 2000; Masten & Cicchetti, 2016; Motti-Stefanidi, 2019). In other words, any factor that helps an individual eliminate the negative effects of adversities and to function well afterwards could be regarded as part of the resilience process (Lee et al., 2013; Liu et al., 2017; Masten & Cicchetti, 2016). Thus, one aim of this study was to examine whether grit, defined as passion and perseverance towards long-term goals (Duckworth et al., 2007), could function as a resilience factor (i.e., be part of the resilience process) among adolescents.

In the resilience literature, debates and inconsistencies continue regarding the extent to which a condition can be regarded as risky and the degree to which the overcoming of adversity can be regarded as successful. To define adverse conditions, some studies have examined experiences of single adverse events (e.g., spousal loss, economic recession; Infurna & Luthar, 2016, 2017; Motti-Stefanidi & Asendorpf, 2017), whereas others have examined multiple and chronic stressful experiences (e.g., negative life events, socio-economic disadvantages; Anagnostaki, Pavlopoulos, Obradović, Masten, & Motti-Stefanidi, 2016; Gutman, Joshi, & Schoon, 2019; Schoon, 2006). To us, both are acceptable as long as a relationship can be established between the adverse experience(s) and negative developmental (e.g., cognitive, affective or behavioural) outcomes. Once these relationships have been built, judgement regarding adversity can be reached.

To determine the successful adaptation criteria for resilience, different perspectives have been adopted. Some researchers argue that resilient individuals should excel in their development in the face of adversity (see illustration in Masten & Cicchetti, 2016). In contrast, other researchers hold the view that when people recover from adversities and maintain their development at the normal level, their adaptation is successful (Bonanno, 2004; Infurna & Luthar, 2017). The indicators that are used for adaptation criteria also vary across studies. For instance, some studies focus on subjective well-being (Blalock et al., 2015) or school adjustments (Motti-Stefanidi & Asendorpf, 2017). Other studies have looked at major life achievements such as educational accomplishment (Anagnostaki et al., 2016; Schoon, 2006) or employment status (Schoon, 2006). Some studies (especially developmental studies) have also adopted a comprehensive approach and expected to see success in most age-salient developmental tasks (see Masten & Cicchetti, 2016). For example, secure attachment relationship and the capability to move and control one's conduct are major developmental tasks in early childhood. School-aged children, in turn, are expected to master basic literacy and maths skills and to form good relationships with their teachers and peers. Good academic achievement, social conduct, romantic relationships, and workforce skills are expected of adolescents and young adults. On the whole, it is difficult to reach a consensus given the great variation in defining and operationalizing risk and adaptation in resilience studies. To move the field forward, it is best for a study to specify their theoretical orientation and provide an operational definition of the key terms.

The present study operationalizes the risk condition as a high level of school burnout among adolescents. Instead of choosing objective indicators (e.g., changing schools or failing an exam) as the risk or stress condition, we use self-reported school burnout as representative of risk or stress by acknowledging the important role of subjective experiences and cognitive appraisal in the process of stress response (Crum et al., 2013; Folkman et al., 1986; Skinner & Kindermann, 2020). School burnout, according to Salmela-Aro et al. (2009), consists of three intertwined components:

exhaustion, cynicism and inadequacy. When students feel exhausted because of school demands, they become cynical toward studying (Schaufeli, Martínez, Pinto, Salanova, & Bakker, 2002) and feel inadequate as a student (Salmela-Aro et al., 2009), which diminishes their self-esteem, aspirations and achievements (Salmela-Aro & Upadyaya, 2014, 2017; Tuominen-Soini & Salmela-Aro, 2014). If studying requires too much energy and a student becomes overloaded, this may lead to exhaustion (Salmela-Aro & Upadaya, 2012) and in turn, the resulting cynicism and inadequacy may cause school dropout (Bask & Salmela-Aro, 2013).

This study operationalized resilience as a low level of mental health problems when students are experiencing potentially harmful school burnout symptoms. Specifically, to determine what successful adaptation is, we expected to find that 1) resilient students would have significantly less mental health problems than non-resilient students when both groups of students were in the burnout situations; and 2) the level of mental health problems among resilient students would be at least non-significant or significantly lower than the baseline level. In the present study, the key factor we examined in this resilience process was grit. In summary, we expected to see that grit moderated the association between school burnout and mental health problems, and that gritty students would have a low level of mental health problems when they were at risk of burnout.

The present study focused on two mental health problems – loneliness and depressive symptoms – to help examine the possible resilient role of grit among adolescents. Mental health problems – common results of adverse events and experiences – also show ‘spiral effects’ among individuals (Lasgaard et al., 2011; Witvliet et al., 2010). For example, if adolescents suffering from school burnout report greater loneliness and depressive states, they are less likely to seek help from teachers and peers, and this in turn causes further burnout in the future (Salmela-Aro et al., 2017). Therefore, it is crucial to reduce mental health problems and to include them in studies on resilience (Lee et al., 2013). Loneliness and depressive symptoms are two salient mental health problems among adolescents; both relate to social and interpersonal issues (Lasgaard et al., 2011; Witvliet et

al., 2010), and cause various psychological and behavioural problems and disorders (Hawkley & Cacioppo, 2010; Keenan-Miller et al., 2007).

Grit, Resilience and Well-being

Grit is proposed to be a personality trait that encompasses passion and perseverance while pursuing long-term goals. Studies have shown that it is associated with numerous achievements such as school grades, work performance, program retention rate, and competition performance (Duckworth et al., 2007; Eskreis-Winkler et al., 2014). Previous research has also discussed the similarities and differences between grit and resilience (Goodman et al., 2017; Perkins-Gough, 2013). Being gritty means holding goals and interests for a long period and moving forward in the face of difficulties. Therefore, like resilience, grit involves a coping process in challenging situations. Both grit and resilience are expected to help people maintain positive development. However, as argued by Duckworth, grit, unlike resilience, is more about coping with daily routine challenges than severe adversities (see Perkins-Gough, 2013). Moreover, grit is the process of pursuing self-defined life goals (Duckworth, 2016; Tang et al., 2020), whereas resilience does not necessarily relate to goals. Nevertheless, given the common coping process and measurement overlap between grit and resilience (Goodman et al., 2017), and that this study takes a broad approach to resilience, it is of interest to examine whether grit would work as a resilience factor for at-risk individuals. There is already preliminary evidence supporting this idea. One previous study found that college students who had a high level of grit reported substantially lower suicidal ideation when experiencing intense negative life events (Blalock et al., 2015). Another study (Pennings et al., 2015) using a military personnel sample echoed the previous study and found that grit was associated with less suicidal ideation for participants in hopeless situations. However, so far, no study has examined the possible moderating role of grit on mental health problems among adolescents.

This study, following the framework proposed by Fergus and Zimmerman (2005), examined the effect of grit using two models of resilience – the compensatory model and the protective model. The aim of the *compensatory model* is to examine the direct effects of grit (understood as a promotive factor) and burnout (understood as a risk factor) on mental health problems (e.g., depressive symptoms and loneliness). Promotive factors are factors assumed to support mental health whereas risk factors are assumed to undermine mental health (Fergus & Zimmerman, 2005). Direct effects are the effects that do not involve the interaction between promotive factors and risk factors. Thus, to build grit as a compensatory resilience factor, the direct effects of grit and burnout on loneliness and depressive symptoms shall be examined, and it is expected that the direction of grit and burnout effects on mental health problems are opposite of each other.

Whereas the compensatory model examines the direct effect of promotive factor, the *protective model* looks further at the moderation effect of the promotive factor. That is, whether the association between the risk factor and the outcomes are altered by the level of the promotive factor. This is done by adding an interaction term of the promotive factor and the risk factor to the compensatory model. If a promotive factor can mitigate the negative effect of the risk factor on outcomes, then this factor can be regarded as a protective resilience factor. Thus, a protective model of resilience can be established. To examine the protective resilience role of grit in this study, we investigated the interaction effect of grit and school burnout in terms of loneliness and depressive symptoms. The protective model can be further divided into a *protective-stabilizing model* or a *protective-reactive model*, depending on the nature of the associations between risk and negative outcomes when the protective factor is present (Fergus & Zimmerman, 2005; Luthar et al., 2000). If the protective factor removes the association between the risk and negative outcomes completely, this is regarded as a protective-stabilizing model. If the protective factor diminishes the effect of the risk on the negative outcomes but does not remove their association completely, this should be regarded as a protective-reactive model. Previous studies have shown that grit associates negatively

with loneliness and depressive symptoms (Datu et al., 2019; Jiang et al., 2019; Pennings et al., 2015). This confirms that grit is a potential compensatory resilience factor for loneliness and depressive symptoms. However, whether grit can act as a protective resilience factor needs to be examined. On the basis of earlier findings (Blalock et al., 2015; Pennings et al., 2015), we expected grit to moderate the influence of burnout on loneliness and depressive symptoms among adolescents.

Associations between grit and adolescents' loneliness, depressive symptoms, and other aspects of well-being have been previously reported (Datu et al., 2019; Jiang et al., 2019; Tang et al., 2019), but whether grit can help adolescents who experience adversities maintain or even enhance (i.e., examining the protective resilience role of grit) their well-being is largely unknown. Moreover, recent studies of grit (Credé et al., 2017; Guo et al., 2019) suggest that two of its dimensions – consistency of interest and perseverance of effort – would be best studied separately given their different role in predicting outcomes (Disabato et al., 2019; Tang et al., 2019). Consistency of interest (CI) means the sustaining of goals or interests over a longer period of time, whereas perseverance of effort (PE) refers to maintaining behaviours in the face of challenges and obstacles (Duckworth et al., 2007). To date, the resilience models of grit have not been examined in terms of two dimensions (i.e., CI and PE). Therefore, one of our research aims was to examine the two grit dimensions independently, and their moderation effect on the association between school burnout and mental health problems (i.e., loneliness and depressive symptoms).

In addition, given the extensively reported gender differences in adolescents' well-being (Allgood-Merten et al., 1990; Lindfors et al., 2012; Salmela-Aro et al., 2008), it was also of interest to examine the role of gender in the interplay between grit, school burnout and mental health problems. Although no gender differences were found in relation to grit (Duckworth & Quinn, 2009), it has been reported that adolescent girls tend to have higher depressive symptoms and

school burnout (Salmela-Aro, Savolainen, et al., 2009), whereas adolescent boys report slightly higher loneliness than girls (Maes et al., 2019).

The Present Study

The central aim of the study was to examine the resilient role of grit among adolescents who experienced burnout in schools. The context of the study, Finland, is globally regarded as having a high-quality education system (Välijärvi et al., 2007). However, recent studies have shown that about 33–45% of Finnish students are at an increased risk of burnout (Salmela-Aro, Kiuru, et al., 2009; Salmela-Aro & Upadyaya, 2020) and suffer multiple well-being problems in schools (Bask & Salmela-Aro, 2013). Consequently, in addition to studies that inform us of how to reduce school burnout, there is a need for studies that show how to prevent the detrimental effects of burnout. In some situations, when burnout or stress are inevitable (e.g., final stages before college entrance exams), such studies are essential. Resilience studies would be helpful in answering the second question and would have practical implications for adolescents. Currently, as the world is experiencing a pandemic and many schools are closed, this new adversity situation makes resilience studies even more imperative than usual for youth and adolescents (Masten & Motti-Stefanidi, 2020). In summary, the study addressed three research questions.

1. Is high school burnout, characterized by exhaustion, cynicism and inadequacy, associated with a high level of loneliness and depressive symptoms among adolescents? On the basis of earlier studies (Fiorilli et al., 2017; Salmela-Aro, Savolainen, et al., 2009), we expected to find that school burnout was positively associated with loneliness and depressive symptoms among adolescents (Hypothesis 1).
2. Does grit, measured as consistency of interest and perseverance of effort, moderate the associations among school burnout, loneliness and depressive symptoms? On the basis of previous findings among adults (Blalock et al., 2015; Pennings et al., 2015), we

expected gritty adolescents suffering from burnout to have fewer loneliness problems and depressive symptoms than less gritty adolescents (Hypothesis 2).

3. What role does gender play in the associations (i.e., direct and moderation effects) among grit, burnout and loneliness and depressive symptoms? Adolescent girls in general tend to have more mental health problems (Allgood-Merten et al., 1990; Lindfors et al., 2012; Salmela-Aro, Savolainen, et al., 2009) than boys, whereas no gender differences have been found in relation to grit (Duckworth & Quinn, 2009). We thus expected to find the role of grit to be equal for girls and boys (Hypothesis 3).

Methods

The sample in the present study was from the Finnish Mind-the-Gap longitudinal study (2013–2016; 6th grade-9th grade). It consisted of 1296 Finnish adolescents (56.4% female) in the 7th grade and 1166 students (57.4% female) in the 8th grade. Most key variables used in this study (e.g., grit, burnout, loneliness and depressive symptoms) were from the 8th grade, as grit was first included in the project in the 8th grade. However, we included the 7th grade loneliness and depressive symptoms as covariates in order to control for their baseline level. The response rate at each time wave was high (98.2% and 96.8%, respectively for the 7th and 8th grade). The questionnaire was administered during school hours and took about an hour to complete. Participation was voluntary, and informed consent forms were collected from both the students and their parents.

Measurements

School Burnout. The present study assessed school burnout using the School-Burnout Inventory (SBI; Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009) in the 8th grade. The SBI contains 10 items measuring three factors of school burnout: (a) exhaustion at school (four items, e.g., ‘I feel overwhelmed by my schoolwork’), (b) cynicism toward the meaning of school (three items, e.g., ‘I feel that I am losing interest in my schoolwork’), and (c) sense of inadequacy at school (three items, e.g., ‘I often have feelings of inadequacy in my schoolwork’). All the items were rated on a six-

point Likert-type scale ranging from 1 (completely disagree) to 6 (strongly agree). However, Confirmation Factor Analysis (CFA) confirmed that the three-factor model ($\chi^2(32) = 290.85$, CFI = .95, TLI = .92, RMSEA = .08, SRMR = .04) had a better model fit than the one-factor model ($\chi^2(35) = 578.99$, CFI = .89, TLI = .85, RMSEA = .116, SRMR = .06). Therefore, this study treated burnout as three factors (i.e., exhaustion, cynicism, inadequacy). Cronbach's alpha was .84, .90, .86, respectively for the three factors.

Grit. Grit was measured using the short version of the grit scale in the 8th grade (8 items; Duckworth & Quinn, 2009). Two subscales of grit, consistency of interests (CI: e.g., 'I often set a goal but later choose to pursue a different one') and perseverance of effort item (PE: e.g., 'I am diligent'), were assessed each using four items from a Likert scale of 1 = *not at all like me,* to 5 = *very much like me*. Cronbach's alpha for CI was .70, and for PE .78.

Loneliness. Students' loneliness was assessed using a Finnish version of the revised UCLA Loneliness Scale (Russell, 1996), consisting of eight statements on how lonely students consider themselves to be (e.g., 'I would like to have more friends', 'I feel like an outsider'). The participants rated the items on a four-point scale ranging from No (1) to Often (4). Two reversed items (e.g., 'I'm extrovert') were excluded due to their low factor loadings. Cronbach's alphas were .86 for the 7th grade and .88 for the 8th grade.

Depressive symptoms. Depressive symptoms were measured using the DEPS scale (Salokangas et al., 1995), which consists of 10 questions on the participants' mood during the last month (e.g., 'I have felt sad; I have felt that my future is hopeless'). Students responded on a four-point Likert-type scale ranging from 1 (not at all) to 4 (very much). Cronbach's alphas for this scale were .92 for the 7th grade, and .94 for the 8th grade.

Covariates. Gender and social economic status (SES) were assessed in the 8th grade. SES was determined by asking participants to rate their family's financial situation (1 = *bad* to 5 = *good*).

Analysis Strategy

Structural Equational Modelling (SEM) was conducted using the Mplus statistical package (Version 8.2; Muthén and Muthén 1998–2018). First, an SEM model (Model 0) was built to examine the regression effect of school burnout on loneliness and depressive symptoms while accounting for gender and SES. Then we added prior loneliness and depressive symptoms to control for the baseline level of psychosocial problems (Model 1). Second, we added grit-consistency of interest and grit-perseverance of effort (Model 2), and then their latent interaction products with burnout as additive independents (Model 3). Finally, based on Model 3, we formed separate two models for boys and girls (Model 4a and Model 4b).

This project used a snowball strategy to recruit the sample, in which we incorporated new students to compensate for the loss of previous-wave students. Of the 1296 seventh graders in this study, 768 stayed in the 8th grade. A series of attrition tests were conducted to compare the key studied variables of those who participated in the next data collection and those who dropped out. The 7th graders who participated in the 8th grade (N=768; 59.25%) and those who did not (N=528) did not differ in terms of depressive symptoms (t = .66, p = .51), loneliness (t = -1.24, p = .22), SES (t = .15, p = .88), or school engagement (t = -.07, p = .95) or GPA (t = 1.64, p = .10) in the 7th grade; however, more girls than boys participated in the following data collection (i.e., 8th grade; χ^2 = 5.52, p < .05). Therefore, we used Full Information Maximum Likelihood (FIML) estimation with a robust maximum likelihood estimator to handle the missing data throughout the analyses.

Results

The measurement model was conducted before the test of the structure model, to assess factor structure and inter-correlations among all the variables included in this study. The mean scores, standard deviations, and the correlations between the latent variables are listed in Table 1. The measurement model provided a good fit, χ^2 (1205) = 3676.04, p < .001, CFI = .92, TLI = .91, RMSEA = .03. The sizes of all the factor loadings, ranging from .43 to .88, were acceptable. As

shown in Table 1, three burnout indicators showed significant positive correlations with loneliness (ranging from .22 to .33) and depressive symptoms (ranging from .36 to .51), and negative correlations with two facets of grit (ranging from -.20 to -.40). Two dimensions of grit had significant negative associations with loneliness (ranging from -.14 to -.31) and depressive symptoms (ranging from -.16 to -.27).

Are school burnout and grit associated with loneliness and depressive symptoms?

A series of models were conducted to confirm whether the feeling of exhaustion, cynicism, and inadequacy associated with loneliness and depressive symptoms. The first model (M0) showed that three indicators of school burnout – exhaustion, cynicism and inadequacy – simultaneously associated with loneliness and depressive symptoms after controlling for gender and SES (see Table 2). The next model (M1) demonstrated that these effects held when the prior level of loneliness and depressive symptoms were accounted for (see Table 2). Stronger exhaustion, cynicism, and inadequacy associated with a greater level of loneliness (β = .20, p < .01; β = .18, p < .01; β = .21, p < .01; respectively) and depressive symptoms (β = .35, p < .01; β = .37, p < .01; β = .39, p < .01; respectively). Thus, school burnout was directly associated with loneliness and depressive symptoms.

Next, the two facets of grit were added to the model (M2). The results (see Table 2) showed that grit-consistency was negatively associated with loneliness in the separate models for exhaustion, cynicism, and inadequacy (β = -.21, p < .01; β = -.21, p < .01; β = -.20, p < .01, respectively) and with depressive symptoms (β = -.11, p < .01; β = -.08, p < .05; β = -.07, p < .10; respectively for exhaustion, cynicism, and inadequacy). For grit-perseverance, the results were rather weak, showing that most of the associations were non-significant, except the relationship between grit-perseverance and depressive symptoms (β = -.10, p < .01) in the model for exhaustion. Therefore, these findings implied that grit-consistency was a compensatory factor for psychosocial problems, whereas the role of grit-perseverance was very limited.

Multi-group analysis then examined whether these effects held equal for boys and girls. We found no gender differences in the effects of burnout on mental health problems. However, gender had a main effect on mental health problems. Girls consistently showed a higher level of loneliness and depressive symptoms than boys (βs = -.07 – -.11, $p < .05$).

Does grit moderate the associations between burnout and psychosocial problems?

In the next step, we added the interaction terms of grit and burnout indicators to Model 3. According to the results (see Table 2), grit-consistency moderated the effect of burnout on depressive symptoms (β = -.14, $p < .01$; β = -.14, $p < .05$; β = -.12, $p < .10$; respectively for models of exhaustion, cynicism, and inadequacy). However, we found no significant moderation effects for grit-consistency and burnout on loneliness. For grit-perseverance, we found a significant moderation effect on depressive symptoms only (β = -.12, $p < .01$; for model of exhaustion). Thus, we found that grit, in particular consistency of interest, moderated the association between burnout and depressive symptoms (for the significant interactions, see Figure 1). When adolescents experienced high exhaustion and cynicism in schools, high grit-consistency and grit-perseverance helped them have fewer depressive symptoms. Adolescents who showed high levels of grit reported almost no depressive symptoms, whereas adolescents who showed low levels of grit reported substantially higher depressive symptoms when they experienced high burnout in schools.

Further analysis of gender differences (Model 4a & 4b; see Table 3&4, Figure S1 - S3) revealed that the moderation effects appeared among boys but not girls. For boys, the moderation effects of grit also applied to loneliness. High levels of grit consistency and grit perseverance substantially reduced male students' likelihood of suffering from loneliness and depressive symptoms.

Results Robustness Checking

Given that there was attrition between grades 7 and 8, we ran parallel models without the 7th grade loneliness and depressive symptoms (see Table S1). In general, all our findings were retained.

In fact, the associations were stronger and we found more significant results. Examination of the compensatory model (see Table S1) showed that both grit-consistency and grit-perseverance were directly associated with loneliness and depressive symptoms, except that the associations between grit-perseverance and depressive symptoms in the model concerning inadequacy were not significant. For the protective model (see Table S1) we further found that grit-consistency moderated the associations between burnout and depressive symptoms across all the burnout indicators. Again, grit-perseverance moderated the associations between exhaustion and depressive symptoms. The interaction term between grit-perseverance and cynicism/inadequacy became marginally significant. Grit's moderation effects on loneliness remained non-significant, although some of them became marginally significant. As regards gender differences, the results consistently favoured boys more than girls (see Table S2 and S3).

Discussion

School burnout has been found to be one of the most prominent risk factors leading to adolescents having mental health problems and dropping out of school (Bask & Salmela-Aro, 2013; Salmela-Aro, Savolainen, et al., 2009). By characterizing burnout as exhaustion, cynicism and inadequacy, the present study found that these three indicators were consistently associated with a high level of loneliness and depressive symptoms. These effects held even after gender, social economic status, prior levels of loneliness and depressive symptoms were accounted for. Thus, the present study established the risk factor role of burnout in loneliness and depressive symptoms among adolescents. Further, when the two grit factors and their interaction terms with burnout indicators were included in the analysis model, the results showed that grit-consistency, but not grit-perseverance, acted as a compensatory factor (i.e., showing direct effect; Fergus & Zimmerman, 2005) for loneliness and depressive symptoms. However, both grit-consistency and grit-perseverance protected against depressive symptoms among adolescents who experienced high levels of exhaustion and cynicism. When adolescents felt overwhelmed and devalued the

significance of school learning, two grit facets protected them against high levels of depressive symptoms. It is interesting to note that the findings of protective effects of grit were in a 'protective-reactive' rather than 'protective-stabilizing' pattern (Fergus & Zimmerman, 2005; Luthar et al., 2000). That is, grit did not completely remove the negative effect of exhaustion and cynicism on depressive symptoms. However, high grit-consistency and grit-perseverance protected exhausted and cynical students against depressive symptoms by decreasing their symptoms to below-average levels. Consistency of interest refers to having passion and high commitment towards long-term goals, whereas perseverance of effort is known as tenaciousness and working hard in the face of challenges and setbacks (Duckworth et al., 2007). It is not surprising to find that adolescents who have passion and work hard for long-term goals are less likely to report being overburdened and cynical at school, and in turn, have fewer depressive symptoms. A previous study demonstrated that grit elicited more sense of meaning in life and thus led to less depression among high school students (Datu et al., 2019). It is possible that through the life meaning construction and re-construction process (Masten & Cicchetti, 2016), grit-consistency and grit-perseverance serve as resilient factors against negative outcomes caused by high burnout.

Gender differences were examined throughout the analyses in this study. Although the negative effects of burnout on loneliness and depressive symptoms were equal among boys and girls, gender had main effects on well-being. Girls were more prone to experience loneliness and depressive symptoms than boys, which was consistent with earlier studies of Finnish adolescents (Lindfors et al., 2012; Rönkä et al., 2014; Salmela-Aro, Savolainen, et al., 2009). In line with another earlier study (Duckworth & Quinn, 2009), this study found no gender differences in the two grit dimensions. However, when examining the protective role of grit against burnout and negative well-being problems separately for boys and girls, the results uniformly favoured boys, which contradicted our hypothesis (H3). For male adolescents, the two grit factors consistently played a resilient role against not only depressive symptoms but also loneliness. The protective effect

patterns manifested as ‘protective-stabilizing’ on exhaustion conditions and even as ‘protective-enhancing’ on cynicism and inadequacy conditions (Fergus & Zimmerman, 2005; Luthar et al., 2000). In other words, high grit-consistency and grit-perseverance helped *male* adolescents who were experiencing school burnout have less problems in terms of loneliness and depression. Previous studies have reported a gender difference in responding to stress (Broderick, 1998; Hampel & Petermann, 2005). Boys are better in using adaptive coping strategies such as distraction and problem-solving, whereas girls are more likely to use maladaptive strategies such as rumination and self-focusing. Therefore, it is plausible that gritty boys, who are also more conscientious (Duckworth et al., 2007), more often use adaptive strategies to help them reduce the negative effect of high burnout (Carver & Connor-Smith, 2010). In addition, as boys reported a lower level of mental health problems than girls and the grit effects were observed among boys, these results may also imply that grit works better in comparatively lower risk situations (as compared to the risky level experienced among girls). This echoes Duckworth’s argument that the challenges that grit deals with are not severe adversity but are daily routine challenges (see Perkins-Gough, 2013). On the other hand, it also reminds us the possible contexts and targeted population when grit acts as a resilience factor. However, since no previous studies have found grit to have a gendered resilient role, future studies are still needed to provide a comprehensive understanding of this topic.

It is also interesting to find that two facets of grit showed different influences on the two mental health problems. Grit-consistency displayed consistent and stronger effects on both loneliness and depressive symptoms, whereas grit-perseverance was mainly associated with depressive symptoms. At first glance, this is contrary to the findings of previous studies that grit-consistency has negligible effects (Credé et al., 2017; Muenks et al., 2017; Tang et al., 2019). However, it is important to note that most of these studies focused on achievement or performance but few of them focused on wellbeing. Recent facet-level analysis studies (Schmidt et al., 2018, 2020) have found that the consistency of interest displays a unique variance that cannot be captured

by conscientiousness. Grit-consistency has also been found to be associated with depression (Disabato et al., 2019) and life satisfaction (Schmidt et al., 2020) at a comparable level with grit-perseverance, although in a study by Disabato et al. (2019) the associations between grit-consistency and subjective happiness/life satisfaction were not evident. As a facet that captures the tendency of people to focus on their ongoing project while resisting distractions, grit-consistency may relate to coping skills that help reduce loneliness and depression (Carver & Connor-Smith, 2010; Hampel & Petermann, 2005). However, grit-perseverance is closer to the industriousness facet of conscientiousness (Schmidt et al., 2020), and thus may have less influence on negative wellbeing problems. The link between grit-consistency and loneliness/depressive symptoms may possibly exist because grit-consistency was negatively phrased and measured, as were loneliness and depressive symptoms (Credé, 2018). We cannot rule out this effect completely in this study, but wish to stress that, according to other studies, attributing the associations of grit-consistency and loneliness/depressive symptoms completely to negative wording is not fully justified. In the above-mentioned study (Disabato et al., 2019), although grit-consistency did not relate to (positively phrased) subjective happiness/life satisfaction[1], it was related to other positive phrased variables such as orientations to happiness, curiosity, and goal-directed flexibility. Furthermore, Schmidt et al. (2020) found an association between grit-consistency and (positively phrased) life satisfaction. Thus, as all these studies (Disabato et al., 2019; Schmidt et al., 2018, 2020) have emphasized, more research is needed of grit-consistency and its various outcomes.

Theoretical and practical implications

The present study could have some important theoretical and practical implications for researchers, educators and policy-makers. First, it shows that grit can be regarded as a compensatory and protective resilience factor and extends the findings into adolescence samples. Second, it shows that the consistency facet of grit plays a significant compensatory and protective

[1] This absence of associations was only at the latent-variable level, not at the observed-variable level.

role in psychosocial problems and among at-risk adolescents. Previous studies on grit have shown that consistency of interest has little effect on achievement and performance (Credé et al., 2017). Our finding to some extent validates the value of consistency of interest, particularly its direct and moderation effects on mental health problems. This encouraging finding also calls for future research to examine the effect of grit-consistency of interest on wellbeing. Third, our findings imply that grit would be a good target for adolescents who are at risk of school burnout, especially boys. Research suggests that building a mastery goal-oriented school culture (Park et al., 2018), forming highly committed educational goals (Tang et al., 2019), building high education aspiration (Tang et al., 2020), and holding a strong life purpose (Hill et al., 2016) are evidence-based practices for developing grit among adolescents. Thus, school practitioners, policy-makers, and other stakeholders could consider these practices in the future.

Limitations and Future Directions

This study has several limitations. First, although it controlled for prior levels of loneliness and depressive symptoms, the data attrition rate from the 7th grade to the 8th grade was high (about 40%). Although our data attrition tests showed that those who stayed and those who dropped out did not differ in terms of key indicators such as loneliness and depressive symptoms, attrition was greater among girls than boys. The high attrition rate also cautions against the current results being interpreted as longitudinal study results. More rigorous longitudinal studies are needed in the future to examine the longitudinal resilient effect of grit on adolescents. Second, although burnout could be regarded as three different factors (i.e., exhaustion, cynicism, inadequacy), future studies should include more indicators for risk exposure or being bullied or isolated, for instance, as adverse conditions for loneliness and depressive symptoms. Thirdly, the measurements used in this study were all self-report measures, which may lead to some measurement bias (Duckworth & Yeager, 2015). We recommend that future studies use diverse formats of measures (e.g., self-report, teacher-report, performance test), at least for grit and risk exposures. Lastly, this study covered an

adolescent sample from Finland only, a Nordic country in which students' academic achievement has been at the top of international comparisons (Välijärvi et al., 2007). A large-scale international study (Disabato et al., 2019) with samples of over 7000 late adolescents and adults from seven continents reported similar findings to ours regarding the associations between the two grit facets and depression. However, a recent comparative study reported that Finland in general had a lower level of school wellbeing than their Nordic and OECD counterparts (Yoon & Järvinen, 2016). Thus, it would be interesting to examine the resilience model of grit in other countries in the future.

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Table 1. *Descriptive among Studied Variables.*

	1	2	3	4	5	6	7	8	9	10	11
1. Exhaustion	-										
2. Cynicism	0.78***	-									
3. Inadequacy	0.87***	0.97***	-								
4. Loneliness	0.32***	0.28***	0.33***	-							
5. Depress	0.48***	0.49***	0.51***	0.63***	-						
6. Grit-CI	-0.28***	-0.36***	-0.40***	-0.31***	-0.27***	-					
7. Grit-PE	-0.20***	-0.36***	-0.38***	-0.20***	-0.26***	0.09	-				
8. prior Loneliness	0.26***	0.22***	0.26***	0.47***	0.41***	-0.14**	-0.21***	-			
9. prior Depress	0.36***	0.36***	0.39***	0.37***	0.46***	-0.16**	-0.22***	0.72***	-		
10. Gender	-0.11**	0.00	-0.02	-0.17***	-0.18***	0.03	-0.02	-0.15***	-0.17***	-	
11. SES	-0.11**	-0.15***	-0.15***	-0.23***	-0.22***	0.07	0.28***	-0.15***	-0.15***	0.11***	-
Mean	2.99	2.57	2.74	1.76	1.58	3.18	3.33	1.79	1.55	1.45	3.96
SD	1.27	1.44	1.35	.69	.63	.73	.79	.66	.61	.50	.98
Range	1-6	1-6	1-6	1-4	1-4	1-5	1-5	1-4	1-4	1-2	1-5

Note. ** p <.01, *** p <.001.

Table 2. *Models Results for Burnout and Grit on Loneliness and Depressive Symptom for* ***Whole Sample***

	Loneliness				Depressive symptom			
	M0	M1	M2	M3	M0	M1	M2	M3
Model for Exhaustion								
Gender	-.10*	-.07*	-.08*	-.08**	-.10**	-.07**	-.08**	-.08**
SES	-.18**	-.14**	-.12**	-.12**	-.16**	-.12**	-.09**	-.10**
Exhaustion	.30**	.20**	.15**	.14**	.44**	.35**	.31**	.30**
prior Loneliness		.41**	.39**	.39**		.16*	.14*	.13*
prior Depress		-.02	-.04	-.04		.19*	.17*	.16*
Grit-CI			-.21**	-.23**			-.11**	-.17**
Grit-PE			-.05	-.06			-.10**	-.13**
Exhaustion × Grit-CI				-.06				-.14*
Exhaustion × Grit-PE				-.05				-.12**
Model for Cynicism								
Gender	-.14**	-.09**	-.09**	-.09**	-.16**	-.11**	-.11**	-.11**
SES	-.17**	-.13**	-.12**	-.12**	-.14**	-.10**	-.10**	-.09**
Cynicism	.25**	.18**	.10*	.08+	.46**	.37**	.33**	.28**
prior Loneliness		.42**	.40**	.40**		.19**	.18**	.17*
prior Depress		-.03	-.02	-.03		.15*	.16*	.15+
Grit-CI			-.21**	-.23**			-.08*	-.15**
Grit-PE			-.03	-.05			-.03	-.09+
Cynicism × Grit-CI				-.05				-.14*
Cynicism × Grit-PE				-.02				-.09+
Model for Inadequacy								
Gender	-.13**	-.09**	-.09**	-.09**	-.15**	-.11**	-.11**	-.10**
SES	-.17**	-.13**	-.12**	-.12**	-.13**	-.10**	-.10**	-.10**
Inadequacy	.29**	.21**	.12*	.11*	.48**	.39**	.36**	.32**
prior Loneliness		.42**	.40**	.40**		.17**	.17**	.16*
prior Depress		-.04	-.04	-.04		.15+	.15+	.14+
Grit-CI			-.20**	-.22**			-.07+	-.12*
Grit-PE			-.03	-.04			-.03	-.06
Inadequacy × Grit-CI				-.05				-.10+
Inadequacy × Grit-PE				-.02				-.07

Note. + p <.10, * p <.05, ** p <.01;

Table 3. *Models Results for Burnout and Grit on Loneliness and Depressive Symptom for* ***Boy***

	Loneliness				Depressive symptom			
	M0	M1	M2	M3	M0	M1	M2	M3
Model for Exhaustion								
SES	-.15**	-.14**	-.11*	-.09+	-.08	-.07	-.04	-.02
Exhaustion	.27**	.23**	.19**	.16**	.39**	.32**	.29**	.24**
prior Loneliness		.22+	.23*	.24*		.06	.06	.08
prior Depress		.09	.08	.05		.26*	.24*	.17+
Grit-CI			-.18**	-.27**			-.13*	-.28**
Grit-PE			-.03	-.10			-.08	-.20**
Exhaustion × Grit-CI				-.13*				-.28**
Exhaustion × Grit-PE				-.17*				-.21**
Model for Cynicism								
SES	-.13**	-.13**	-.10*	-.08	-.06	-.05	-.03	.00
Cynicism	.24**	.19**	.13+	.07	.43**	.35**	.31**	.21**
prior Loneliness		.23*	.23*	.23*		.09	.08	.08
prior Depress		.09	.09	.05		.22*	.21+	.15
Grit-CI			-.19**	-.28**			-.10+	-.25**
Grit-PE			-.03	-.13			-.05	-.21**
Cynicism × Grit-CI				-.14*				-.29**
Cynicism × Grit-PE				-.15+				-.16+
Model for Inadequacy								
SES	-.13**	-.13**	-.10*	-.08	-.06	-.05	-.03	.00
Inadequacy	.26**	.22**	.16*	.11+	.41**	.34**	.31**	.23**
prior Loneliness		.23*	.23*	.22*		.07	.07	.06
prior Depress		.08	.08	.05		.23*	.22+	.16
Grit-CI			-.17**	-.29**			-.10+	-.28**
Grit-PE			-.02	-.13			-.05	-.22**
Inadequacy × Grit-CI				-.15*				-.28**
Inadequacy × Grit-PE				-.15+				-.21**

Note. + p <.10, * p <.05, ** p <.01;

Table 4. *Models Results for Burnout and Grit on Loneliness and Depressive Symptom for* ***Girl***

	Loneliness				Depressive symptom			
	M0	M1	M2	M3	M0	M1	M2	M3
Model for Exhaustion								
SES	-.24**	-.16**	-.15**	-.15**	-.20**	-.14**	-.13**	-.14**
Exhaustion	.31**	.18**	.14*	.13*	.47**	.36**	.32**	.33**
prior Loneliness		.58**	.53**	.53**		.23*	.19+	.17+
prior Depress		-.15	-.15	-.14		.12	.11	.11
Grit-CI			-.20**	-.20**			-.12*	-.15*
Grit-PE			-.06	-.06			-.08	-.08
Exhaustion × Grit-CI				-.02				-.10
Exhaustion × Grit-PE				.02				-.05
Model for Cynicism								
SES	-.23**	-.16**	-.15**	-.15**	-.18**	-.13**	-.13**	-.14**
Cynicism	.28**	.17**	.09	.09	.49**	.39**	.36**	.33**
prior Loneliness		.59**	.54**	.53**		.24**	.22*	.21*
prior Depress		-.15	-.13	-.13		.09	.10	.10
Grit-CI			-.20**	-.20**			-.08	-.13
Grit-PE			-.05	-.05			-.01	-.02
Cynicism × Grit-CI				.01				-.09
Cynicism × Grit-PE				.02				-.05
Model for Inadequacy								
SES	-.22**	-.15**	-.15**	-.15**	-.17**	-.13**	-.15**	-.14**
Inadequacy	.32**	.20**	.11+	.12+	.52**	.41**	.40**	.39**
prior Loneliness		.59**	.54**	.54**		.24*	.22*	.22*
prior Depress		-.17+	-.15	-.14		.07	.08	.08
Grit-CI			-.19**	-.18**			-.06	-.08
Grit-PE			-.04	-.04			-.01	.01
Inadequacy × Grit-CI				.01				-.06
Inadequacy × Grit-PE				.03				-.01

Note. + p <.10, * p <.05, ** p <.01;

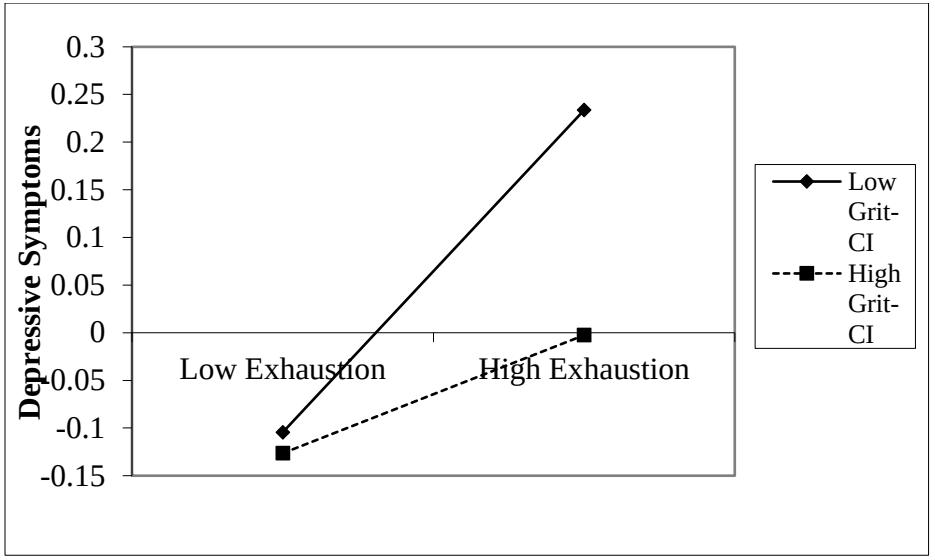

Figure 1a. Grit-CI moderated the association between Exhaustion and Depression

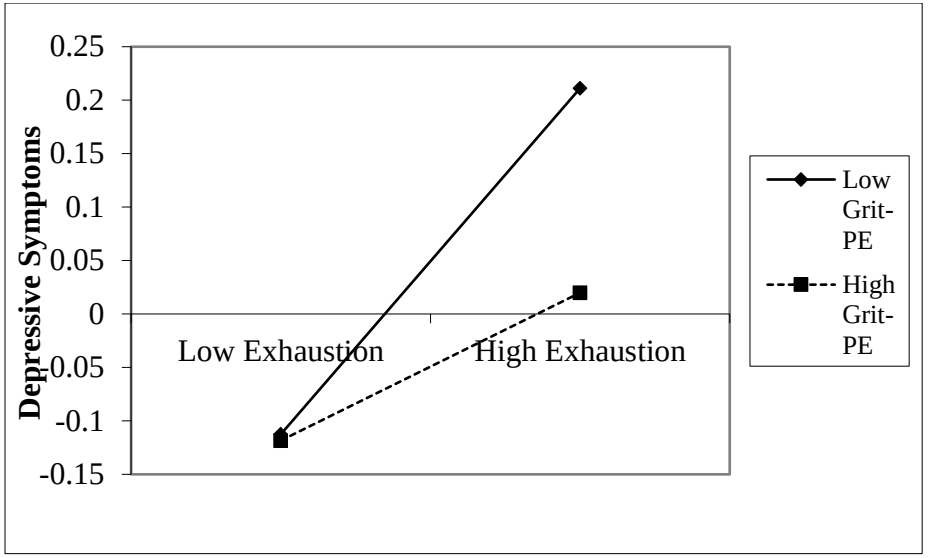

Figure 1b. Grit-PE moderated the association between Exhaustion and Depression

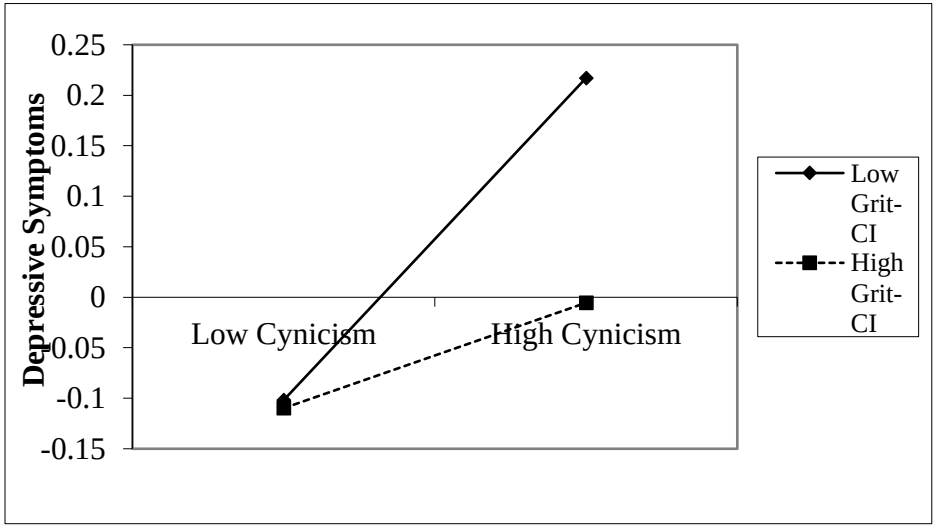

Figure 1c. Grit-CI moderated the association between Cynicism and Depression

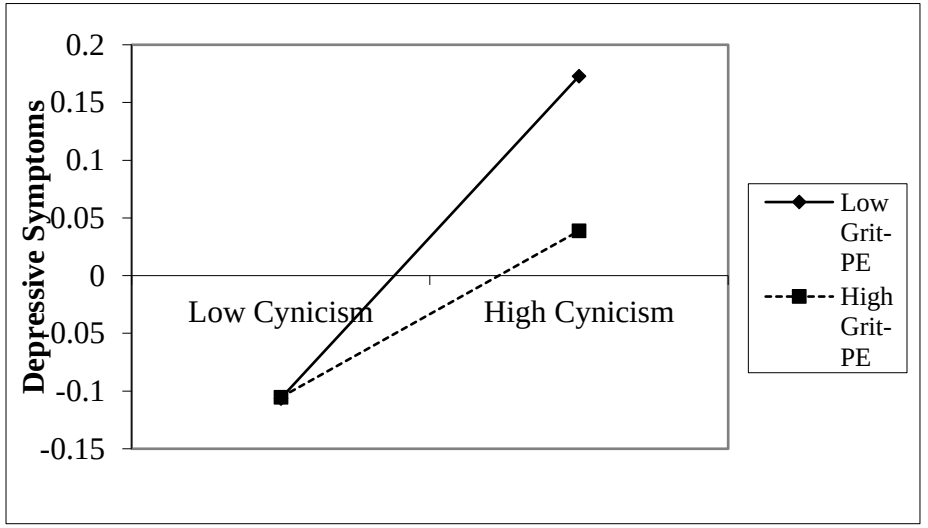

Figure 1d. Grit-PE moderated the association between Exhaustion and Depression

Figure 1. The interaction of grit and exhaustion, grit and cynicism on depressive symptoms

School Burnout and Psychosocial Problems among Adolescents: Grit as a Resilience Factor

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Table S1. *Models Results for Burnout and Grit on Loneliness and Depressive Symptom without Prior Loneliness and Depressive Symptom for* ***Whole Sample***

	Loneliness			Depressive symptom		
	M1	M2	M3	M1	M2	M3
Model for Exhaustion						
Gender	-.10*	-.11**	-.11**	-.10**	-.11**	-.11**
SES	-.18**	-.15**	-.15**	-.16**	-.11**	-.12**
Exhaustion	.30**	.21**	.20**	.44**	.38**	.36**
Grit-CI		-.22**	-.26**		-.14**	-.19**
Grit-PE		-.10**	-.11**		-.15**	-.17**
Exhaustion × Grit-CI			-.08+			-.15*
Exhaustion × Grit-PE			-.07+			-.13**
Model for Cynicism						
Gender	-.14**	-.14**	-.13**	-.16**	-.16**	-.15**
SES	-.17**	-.15**	-.15**	-.14**	-.12**	-.11**
Cynicism	.25**	.14**	.11**	.46**	.40**	.33**
Grit-CI		-.24**	-.27**		-.10**	-.17**
Grit-PE		-.09*	-.11*		-.08*	-.13**
Cynicism × Grit-CI			-.06			-.15*
Cynicism × Grit-PE			-.03			-.09+
Model for Inadequacy						
Gender	-.13**	-.14**	-.13**	-.15**	-.15**	-.14**
SES	-.17**	-.15**	-.15**	-.13**	-.12**	-.12**
Inadequacy	.29**	.18**	.16**	.48**	.43**	.39**
Grit-CI		-.22**	-.25**		-.08*	-.14**
Grit-PE		-.07+	-.09*		-.06	-.09*
Inadequacy × Grit-CI			-.07+			-.12*
Inadequacy × Grit-PE			-.04			-.08+

Note. + p <.10, * p <.05, ** p <.01;

Table S2. *Models Results for Burnout and Grit on Loneliness and Depressive Symptom without Prior Loneliness and Depressive Symptom for* ***Boy***

	Loneliness			Depressive symptom		
	M1	M2	M3	M1	M2	M3
Model for Exhaustion						
SES	-.15**	-.10+	-.08	-.08	-.03	-.01
Exhaustion	.27**	.21**	.17**	.39**	.32**	.27**
Grit-CI		-.17**	-.26**		-.12*	-.28**
Grit-PE		-.11+	-.17**		-.15**	-.27**
Exhaustion × Grit-CI			-.12+			-.28**
Exhaustion × Grit-PE			-.16*			-.20**
Model for Cynicism						
SES	-.13**	-.09+	-.07	-.06	-.02	-.01
Cynicism	.24**	.15*	.08	.43**	.36**	.24**
Grit-CI		-.17**	-.28**		-.09+	-.25**
Grit-PE		-.11+	-.20**		-.12*	-.27**
Cynicism × Grit-CI			-.14*			-.14*
Cynicism × Grit-PE			-.15*			-.15+
Model for Inadequacy						
SES	-.13**	-.09+	-.07	-.06	-.02	.01
Inadequacy	.26**	.18**	.12*	.41**	.35**	.25**
Grit-CI		-.16**	-.28**		-.09+	-.28**
Grit-PE		-.10	-.19**		-.12*	-.28**
Inadequacy × Grit-CI			-.16*			-.30**
Inadequacy × Grit-PE			-.15+			-.21**

Note. + p <.10, * p <.05, ** p <.01;

Table S3. *Models Results for Burnout and Grit on Loneliness and Depressive Symptom without Prior Loneliness and Depressive Symptom for* ***Girl***

	Loneliness			Depressive symptom		
	M1	M2	M3	M1	M2	M3
Model for Exhaustion						
SES	-.24**	-.21**	-.21**	-.20**	-.17**	-.18**
Exhaustion	.31**	.22**	.22**	.47**	.41**	.40**
Grit-CI		-.26**	-.28**		-.16**	-.19**
Grit-PE		-.10*	-.10*		-.11*	-.11*
Exhaustion × Grit-CI			-.05			-.12
Exhaustion × Grit-PE			.02			-.07
Model for Cynicism						
SES	-.23**	-.21**	-.21**	-.18**	-.17**	-.18**
Cynicism	.28**	.15**	.15**	.49**	.43**	.39**
Grit-CI		-.27**	-.28**		-.13*	-.17*
Grit-PE		-.08	-.09		-.02	-.04
Cynicism × Grit-CI			-.02			-.11
Cynicism × Grit-PE			.00			-.05
Model for Inadequacy						
SES	-.22**	-.21**	-.21**	-.17**	-.17**	-.18**
Inadequacy	.32**	.19**	.18*	.52**	.48**	.46**
Grit-CI		-.25**	-.26**		-.10+	-.13+
Grit-PE		-.07	-.07		-.00	.00
Inadequacy × Grit-CI			.03			-.09
Inadequacy × Grit-PE			.00			-.03

Note. + p <.10, * p <.05, ** p <.01;

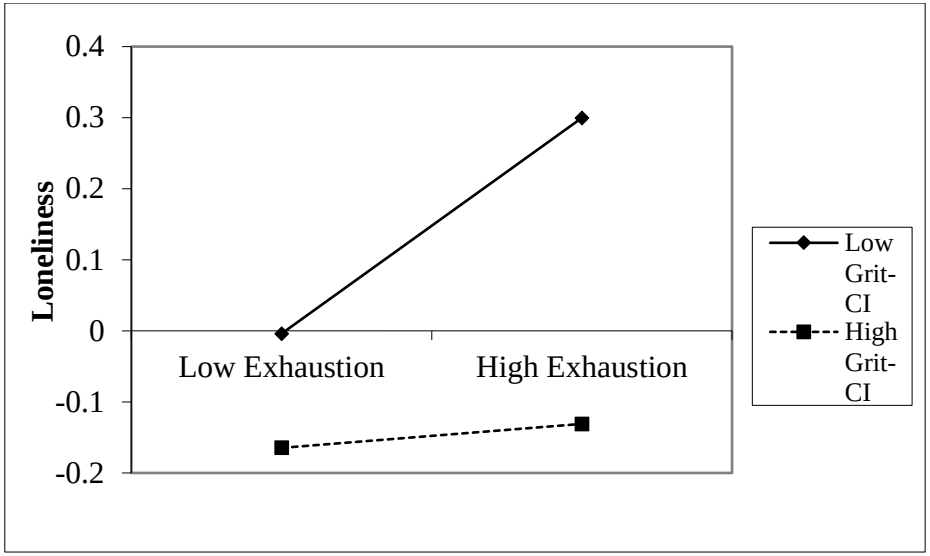

Figure S1a. Grit-CI moderated the association between Exhaustion and Loneliness for Boy

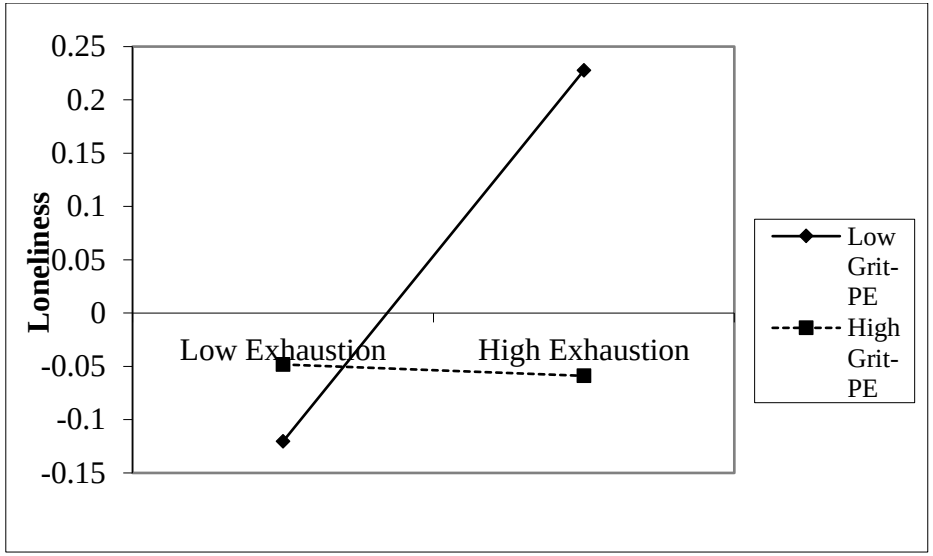

Figure S1b. Grit-PE moderated the association between Exhaustion and Loneliness for Boy

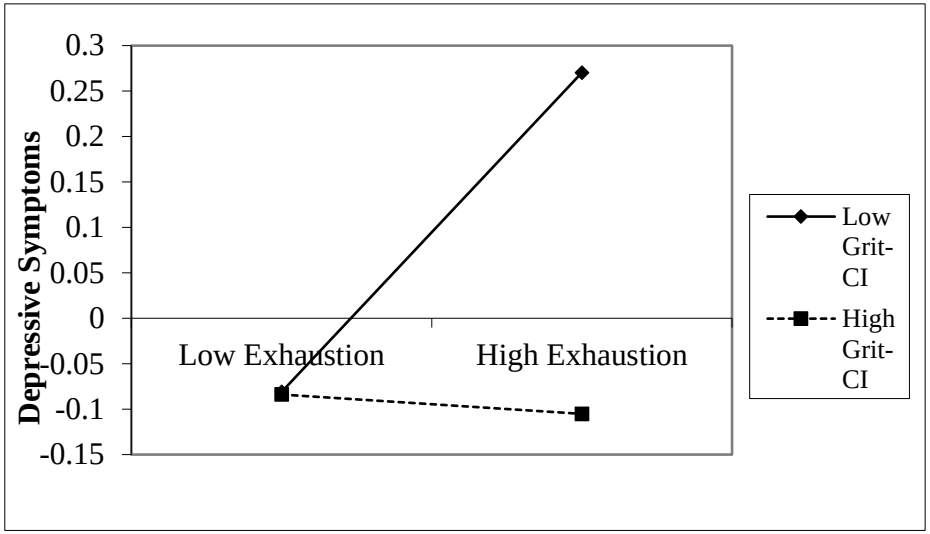

Figure S1c. Grit-CI moderated the association between Exhaustion and Depression for Boy

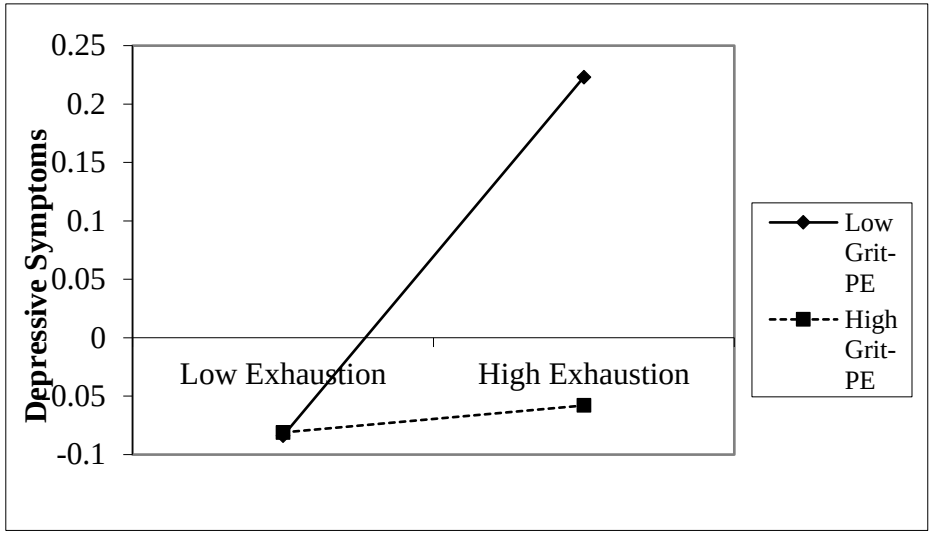

Figure S1d. Grit-PE moderated the association between Exhaustion and Depression for Boy

Figure S1. The Interaction of Grit and Exhaustion on Loneliness and Depressive Symptoms for Boy

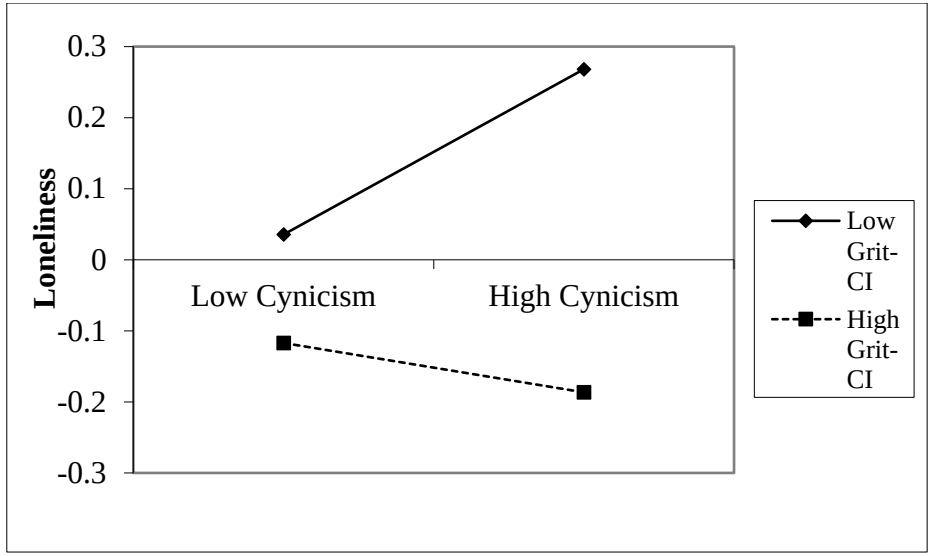

Figure S2a. Grit-CI moderated the association between Cynicism and Loneliness for Boy

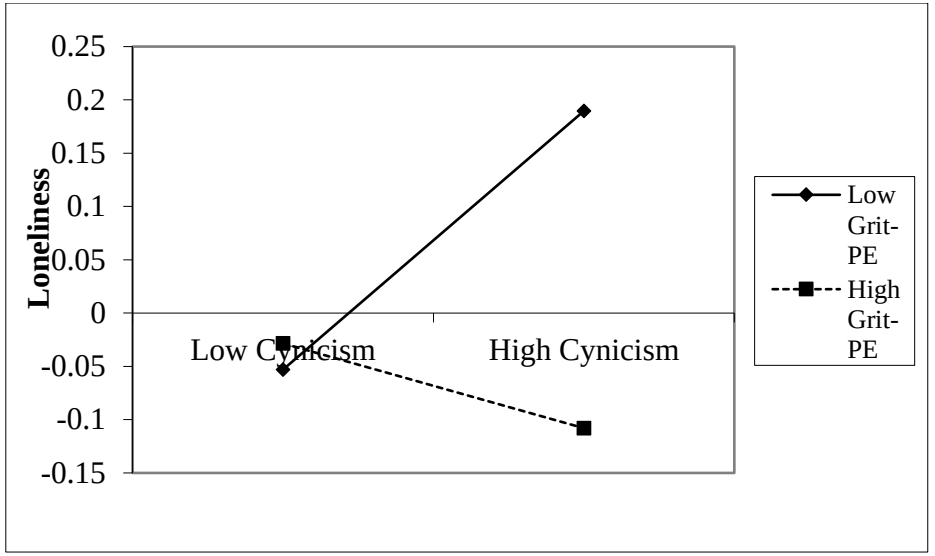

Figure S2b. Grit-PE moderated the association between Cynicism and Loneliness for Boy

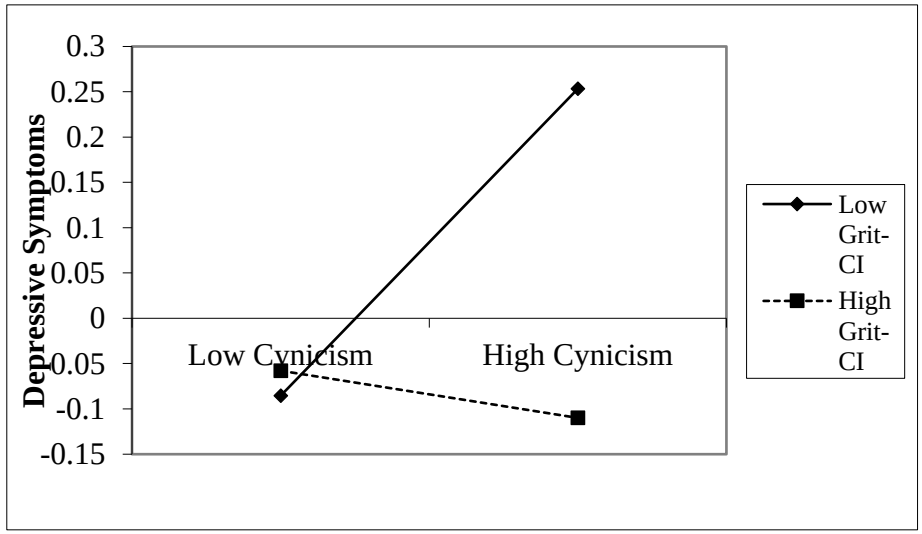

Figure S2c. Grit-CI moderated the association between Cynicism and Depression for Boy

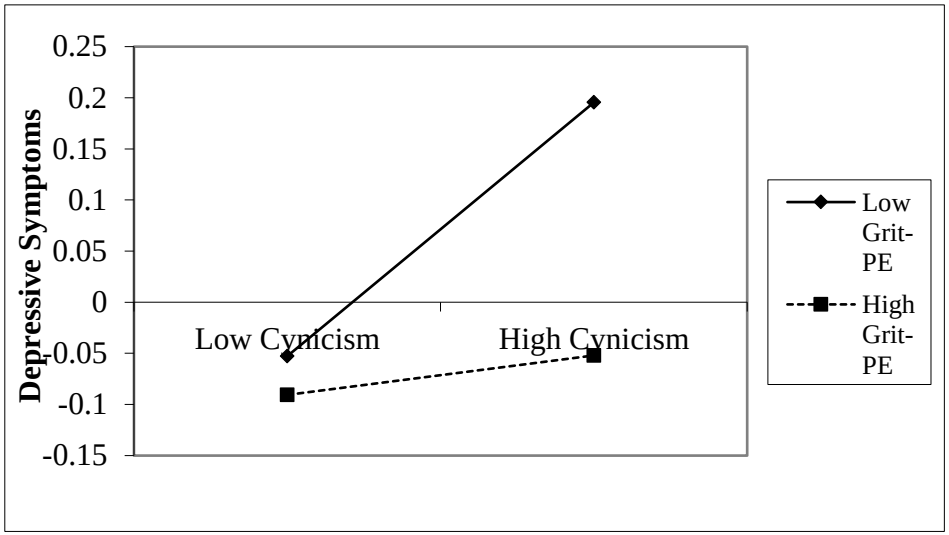

Figure S2d. Grit-PE moderated the association between Cynicism and Depression for Boy

Figure S2. The Interaction of Grit and Cynicism on Loneliness and Depressive Symptoms for Boy

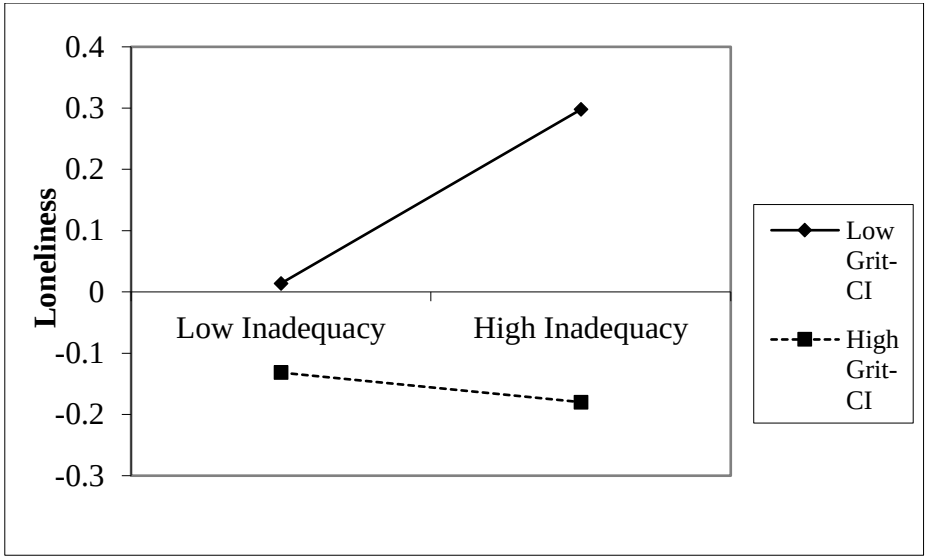

Figure S3a. Grit-CI moderated the association between Inadequacy and Loneliness for Boy

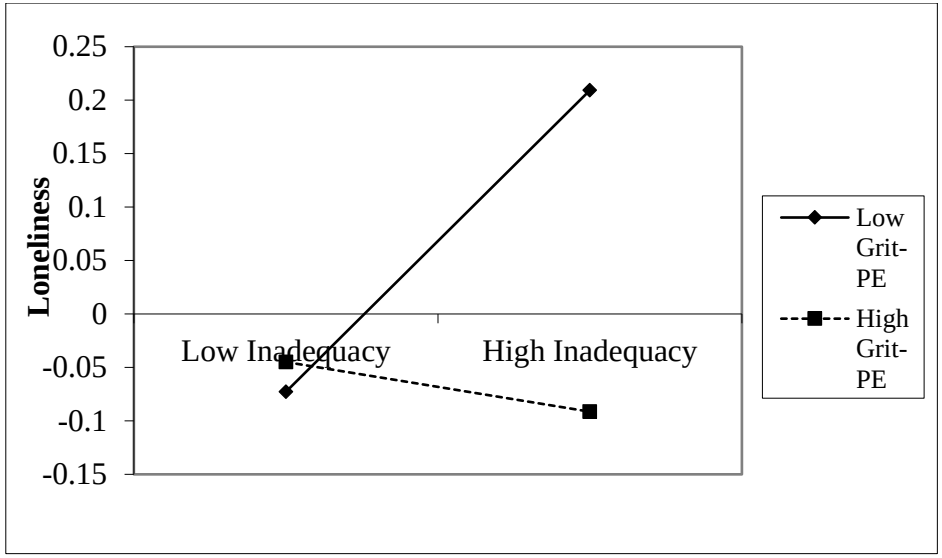

Figure S2b. Grit-PE moderated the association between Inadequacy and Loneliness for Boy

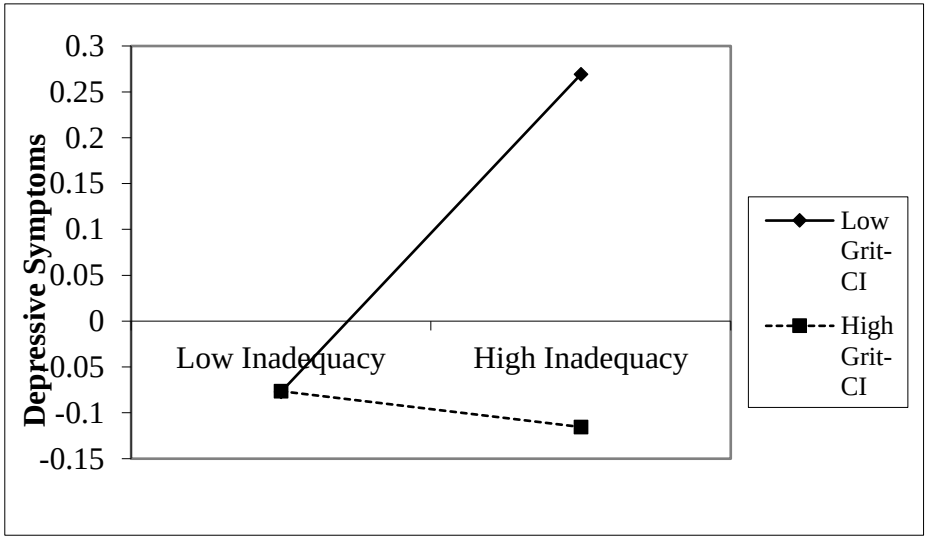

Figure S3c. Grit-CI moderated the association between Inadequacy and Depression for Boy

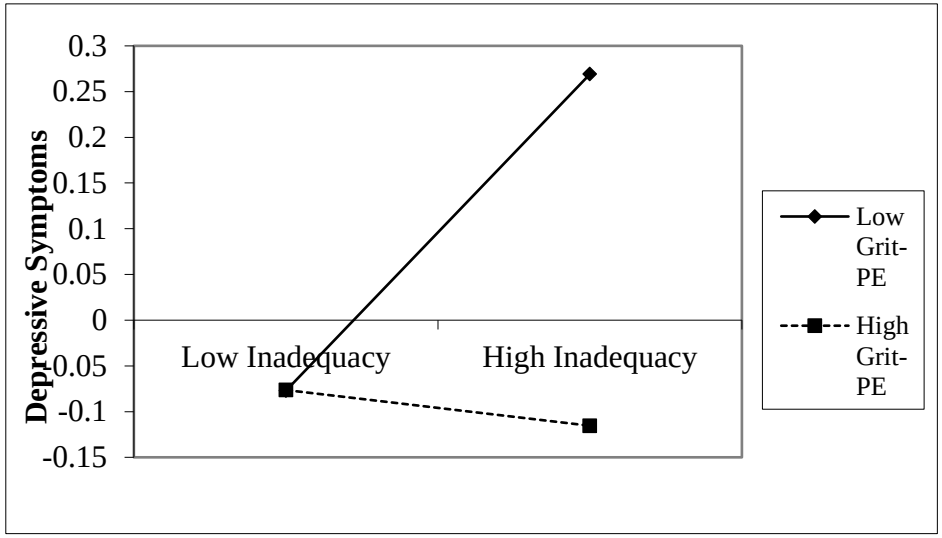

Figure S3d. Grit-PE moderated the association between Inadequacy and Depression for Boy

Figure S3. The Interaction of Grit and Inadequacy on Loneliness and Depressive Symptoms for Boy